

## Amendments to the specification

Please make the following amendments to the specification. Material to be inserted in replacement paragraphs or sections is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is five or fewer consecutive characters or would be difficult to see) in double brackets [[ ]].

Please replace the paragraph beginning on page 4, line 11, with the following rewritten paragraph:

FIGS. 1A-C illustrate the characterization of smart porous materials formed by surface tethered living radical polymerization within mesoporous silica. FIGS. 1A and B show transmission electron microscopy (TEM) micrographs of microtomed samples of particles before and after modification of their porous network via ATRP of NIPAAm.

**ATRP is very useful for the modification of pore surfaces for two reasons. First, the lifetime of the radical on the surface is high (several hours) resulting in a relatively slow polymerization rate that allows uniform polymerization in confined spaces. This property has been exploited in the formation of surface grafted polymer brushes with predictable molar masses, low polydispersity and controllable compositions. Secondly, polymerization is restricted to the surface such that no polymer forms in solution. This also prevents clogging of the pores with free polymer and enables uniform polymerization. We have recently shown that surface grafted brushes of PNIPAAm prepared by ATRP on flat surfaces can exhibit substantial changes in thickness and surface energy as a function of temperature. At low temperatures, the**

**brushes are hydrophilic, hydrated and extended; at higher temperatures, the brushes are relatively hydrophobic and thus dehydrate and collapse.**

Fig. 1A shows the TEM micrograph of mesoporous silica formed by templating with CTAB after calcination and prior to surface modification. Fig. 1B shows the TEM micrograph of hybrid material after modification by surface initiated ATRP of PNIPAA. the hexagonal packing of the pores visible in Fig. 1B shows that the ordered porous structure is maintained through the polymerization process, with an increase in inter-pore spacing. Fig. 1C shows the XRD patterns of porous materials before (o) and after ( $\Delta$ ) ATRP.